

Michigan VII Update

Designing a better transportation system through Vehicle Infrastructure Integration

APRIL-JUNE 2007

MICHIGAN DEPARTMENT OF TRANSPORTATION—VII MICHIGAN PROGRAM

VOL. 1 No. 2

Focus on Technology

by James C. Epolito, President and Chief Executive Officer, Michigan Economic Development Corporation MEDC

Thanks for the opportunity to write this guest column in which I will introduce MEDC, share my thoughts about VII, and review the programs we have in place to incubate this infant industry. Let me preface my remarks with a quote by Anne Bradstreet about the coming of spring, as an analogy for our current economic climate: "If we had no winter, the spring would not be so pleasant; if we did not sometimes taste of adversity, prosperity would not be so welcome."

Introduction to MEDC: We are Michigan's one stop resource for businesses seeking to grow here. Our mission is to keep good jobs in Michigan and attract more of them. Our focus on technology includes support for maintaining and growing Michigan's position as the world's premier center for automotive related research and development.

Thoughts about VII: My first reaction is that VII reminds me of a major movie release, with previews and premiers to stimulate interest prior to the release date with the hope that it is well received by both critics and the public.

Previews & Premier: Currently almost 100 million of VII related work is being conducted. While our cluster of automotive R&D centers made Michigan a natural choice for much of this work, the collaboration

VII Mission:

MDOT's VII mission is to partner with public agencies, the automotive industry, and the telecommunications industry to lead the nation in VII research and sustained VII deployment by providing the public foundation for Michigan's new automotive information technology industry and ensuring improvements in transportation systems safety and operational performance.

among auto companies, universities, and state agencies is equally significant.

Release: There will be hurdles to overcome relative to business, governance, and finance plans, deployment scenarios, and privacy and liability concerns. Yet I'm confident that the potential for addressing safety and congestion issues will provide the impetus for a national release.

Reception: A movie can become a blockbuster and a classic with the approval of both the critics and the public. And while engineers can design critically acclaimed quality VII devices, only the public will determine their acceptance. In a sense, this is a transformation of the auto industry from pure transportation to auto information.

Incubating a New Industry: While the premier VII proof of concept test debuts in Michigan, we

need to create an environment from which spin offs and sequels can also find a home here:

Continue investing in education and training to diversify to ward a high tech economy by nurturing our research universities, which will create the jobs of the future.

Confirm that Michigan is a great place to live and work by emphasizing our access to excellent health care; good schools; a variety of affordable housing that appeals to singles and families; a safe environment; ample cultural, entertainment, and recreational venues; historic preservation; job creation; and transportation choices. We need to create vibrant cities because they attract young, talented, and creative people.

Maintain infrastructure to move people and goods efficiently and safely. If we acknowledge that congestion and deterioration are generally accepted signs of infrastructure neglect, then we must come up with innovative ways to address our critical infrastructure needs.

In closing, the collaboration among diverse groups to help the VII program achieve its potential in Michigan is both challenging and refreshing. I trust that future editions will reveal further progress in the months to come, as Michigan drives toward a more sophisticated and safer transportation future that in turn creates the jobs of the future.



COURTESY MEDC

Connected Vehicle Proving Center in Michigan

The global automotive and telecommunication communities will soon have a one of a kind proving center dedicated to advancing emerging technologies with the additional goals of increasing vehicle safety and creating jobs in Michigan. This center, the Connected Vehicle Proving Center CVPC, will test, evaluate, and showcase VII and other connected vehicle products and services, as well as create a pipeline for real time broadband communication between vehicles, roadside transceivers, and remote service centers. The CVPC's goal is to support the development, evaluation, and validation of connected vehicle technologies, including those commonly referred to as vehicle infrastructure integration, that use a wide range of communication protocols. The CVPC will serve to assure the performance and reliability of these systems before full deployment begins.

To establish and develop the CVPC, the Center for Automotive Research CAR, a non profit research organization located in Ann Arbor, was awarded a grant by Michigan's 21st Century Jobs Fund, which is administered by the Michigan Economic Development Corporation. Including additional matching funds, this project totals 6.9 million. The CVPC gains an industrial focus from the Connected Vehicle Trade Association CVTA. In addition to CAR and CVTA, the project team includes universities, government agencies, automotive companies, automotive suppliers, and telematics firms.

Over the next five years, the CVPC intends to spark the creation of a significant number of jobs in Michigan to design, develop, and deploy the products and services needed for VII and other connected vehicle technologies.

"One of our first tasks will be to create a consortium of non profit and for profit organizations, along with selected public agencies and universities, to advise the CVPC," says Steve Underwood, who is the project director for CAR. "We see this as the critical first step toward enabling a full understanding of the needs and objectives of the private and public entities involved in the connected vehicle environment."

CAR and CVTA jointly will develop and operate the Proving Center, which at least initially will be located within CAR. The CVPC will be made available to public and private entities as a highly functioning environment for product testing and evaluation. Over time, the CVPC should evolve into a connected vehicle showcase and a laboratory for certifying and validating technologies.

The project includes participation from General Motors, DaimlerChrysler, Ford Motor Company, Nissan, the Michigan Department of Transportation, the University of Michigan Transportation Research Institute, the Road Commission for Oakland County, NAVTEQ, Motorola, Sun Microsystems, Intel, Delphi, Zoom InfoSystems, ARINC, MTS Technologies, the Vehicle Infrastructure Integration Consortium, Cogenia Partners, and Cisco Systems.

For more information, contact Steve Underwood, Ph.D., Center for Automotive Research, 734 929 0494, sunderwood@cargroup.org.

Special Session on Connected Vehicles at MBS

On August 7, 2007, at CAR's Management Briefing Seminars in Traverse City, Steve Underwood and Pat Flaherty will co chair the session "Cooperating on the Connected Vehicle and Digital Highway." This session will include high level speakers from organizations involved in VII and connected vehicles who will explore a wide range of elements needed to support connected vehicles, including in vehicle and roadside devices and wireless communications, as well as the public and private services that will be provided by these new systems and the business models that will enable these systems to succeed.

For more information on this session, visit www.cargroup.org.

International Vehicle Communications Summit

MDOT and Caltrans convened an international discussion on vehicle communications initiatives akin to VII at the TRB Annual Meeting. MDOT Director Kirk Steudle welcomed participants including representatives from state and national governments, the European Community, U.S. DOT, AASHTO, and ITS America. The roundtable aims to promote awareness of vehicle communication initiatives worldwide and to share information, approaches, and lessons learned. The primary drivers for vehicle communications are safety and crash avoidance, with additional benefits including more efficient traffic flow, reduced vehicle emissions, and lower energy demand.

Larry Orcutt, Chief of the Division of Research and Innovation at Caltrans, described the momentum created by California's 2005 VII demonstrations and reported that Caltrans is focusing on the full

deployment and expansion of the VII California Bay Area Testbed.

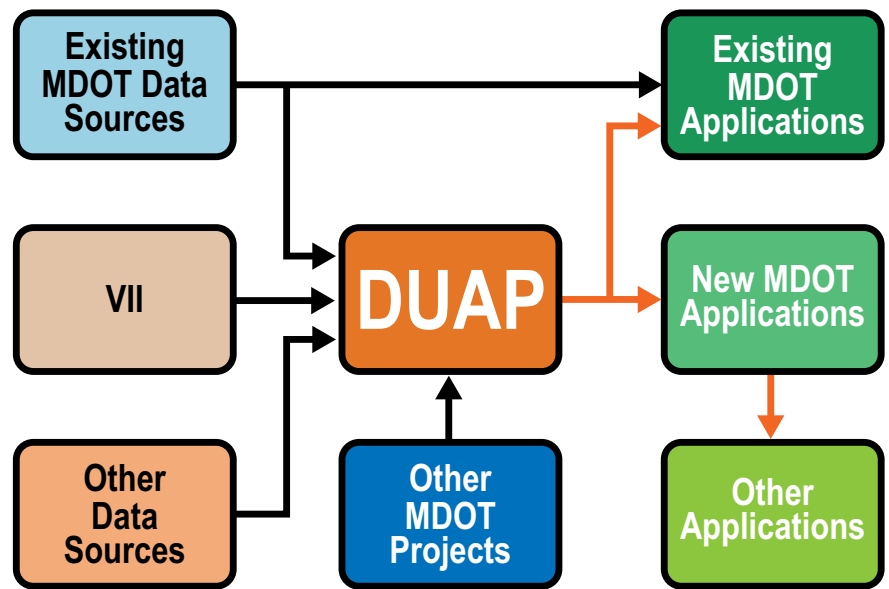
Reinhard Pfliegl, Managing Director of AustriaTech, is coordinating the European Commission Cooperative Networks for Intelligent Road Safety project to develop infrastructure to vehicle data communication for efficient transport management in dense traffic flow. The project hopes to create additional capacity and prior warning of impending traffic slow downs, using general purpose equipment installed in the roadside for tolling services. The proof of concept will be tested at three test sites involving five motorway operators.

Ingemar Skogo, Director of the General Swedish Road Administration, expressed pleasure in signing a Memorandum of Understanding with MDOT for vehicle communication research and development. Sweden is investing in in vehicle communication deployment via the Intelligent Vehicle Safety Systems IVSS joint venture by public and private companies and industry organizations, to stimulate research and development for future road safety.

Fabrizio Minarini, Head of the Intelligent Car Initiative, presented the European Community perspective. Under the eSafety Initiative, the EC works with industry to accelerate the deployment of integrated safety systems that use information and communication technologies to increase road safety. The aim is to bring research results to the market faster, as legislation of such safety systems is slow and risks the entrenchment of obsolete technology.

The roundtable brought forth a collective interest in sharing vehicle communications data and methodology, and disseminating best practices. It also identified the need to work together in a structured approach.

For more information, contact Peter Sweatman, UMTRI Director, 734 936 2070, sweatman@umich.edu.



COURTESY MIXON / HILL

VII Data Use Analysis and Processing

The VII Data Use Analysis and Processing DUAP project is off to a fast and furious start. It will analyze vehicle information in conjunction with existing data sources and create applications that enhance DOT activities.

Mixon/Hill led two stakeholder meetings to gather needs for the DUAP project: one in Lansing with 24 attendees and the other in Detroit with 31 attendees. The attendees included stakeholders from MDOT, FHWA, VII C, UMTRI, SEMCOG, local agencies, and consultants working on ITS projects in Michigan. Participants shared information on their current operations and how VII data could enhance their daily activities. Additional information will be obtained from stakeholders through supplementary meetings, interviews, and document submission.

From the information gathered and the needs identified, the Mixon/Hill team will create a concept of operations ConOps. The ConOps will document the agencies' current methods of operations, the justification for why a change is needed, an overview of what the new system

will look like using VII data, and scenarios that demonstrate how operations might be performed with the new system.

As shown in the diagram, the DUAP project will use existing MDOT data sources, information from vehicles, and other applicable data such as weather information from the National Weather Service to create both new and expanded applications. New MDOT applications may send DUAP information to applications owned by other agencies for example, information may be sent to the U.S. DOT VII group for creation of messages back to vehicles. The DUAP project will also work in coordination with other MDOT projects that currently are or soon will be active.

Next steps include meeting with other agency stakeholders to gather additional needs and bringing all the stakeholders back together to review the scenarios documented in the ConOps. After the ConOps is finalized, the requirements document will begin. We are all looking forward to a successful project!

For more information, contact Steven J. Cook, P.E., Operations Engineer for VII, MDOT, 517 322 5709, cooksj@michigan.gov or Greg Krueger, P.E., Statewide ITS Program Manager, MDOT, 517 373 9479, kruegerg@michigan.gov.

Evaluation of the Economic Impacts of VII

A team at Michigan State University and the Center for Automotive Research is examining the economic contribution of the VII research and deployment program in Michigan. The study will provide policymakers with an estimate of the economic contribution to the state's economy from the jobs, corresponding wages, and other compensation that will be created through direct employment in the industry. The contribution of indirect employment and the effects on tax revenues will also be estimated. The estimates will be determined through modeling of the regional economy. The study will also offer insight into the industrial sectors of Michigan's economy that will benefit from VII research, development, and deployment.

The study is in full swing. Data and economic model acquisition, as well as contacts with the key stake

holders, are in progress. Determining the scope of the VII research and development effort is at the heart of performing this analysis. This includes understanding the likely timelines for research and deployment of various end use cases, and the near term employment and wage inputs for the model. The literature review is complete, and interviews with industry experts are ongoing. These interviews are providing both a view of the current status of technical developments as well as expected future developments.

Once the scope of the program with related employment impacts is determined, several scenarios will be created to perform a sensitivity analysis on a range of inputs and outcomes. Each scenario will be modeled to offer a reasonable estimate of the spectrum of economic impacts that might be realized in Michigan from VII research, development, and deployment efforts.

Upcoming Events

ITS Michigan Annual Meeting,
May 16–17, Rock Financial Showplace,
 Novi, MI, www.itsmichigan.org
ITS Roundtable, May 15, 3:30–4:30 p.m.,
 moderated by Peter Sweatman.
Michigan Update, May 16, 9:30–10:30 a.m.,
 presentation by Peter Sweatman.

ITS America Annual Meeting,
June 4–6, Palm Springs, CA, www.its.org

National Rural ITS Conference,
October 7–10, Grand Traverse
 Resort, Traverse City, MI,
www.michigan.gov/mdot/

Management Briefing Seminars,
August 6–10, Grand Traverse Resort,
 Traverse City, MI, www.cargroup.org

The final economic and employment impact analysis report, scheduled for release at the end of August, will detail direct and intermediate employment count, state taxes generated, and total compensation for both direct and intermediate employment including personal income and aggregate total of mandated state benefits including workers compensation.

For more information, contact Kunwar Rajendra, Ph.D., P.E., Adjunct Professor, Department of Electrical and Computer Engineering, MSU, 517 353 9562, rajendr2@egr.msu.edu.



Members of the Integrated Vehicle-Based Safety Systems (IVBSS) study, one of the three major VII projects being conducted in Michigan, visited UMTRI in March. UMTRI is the prime contractor of this project to develop systems to warn drivers who are about to leave the roadway or collide with another vehicle. Here the group examines a test vehicle. Clockwise from driver's seat: Shelley Row—ITS Joint Program Office; Jim Sayer—UMTRI; Tim Tiernan—Visteon; Jack Ference and Steve Sill—NHTSA; and Debby Bezzina—Visteon.

© 2007 Michigan Department of Transportation

Gregory D. Krueger, P.E.
Statewide ITS Program Manager
 517-373-9479 • kruegerg@michigan.gov
www.michigan.gov/mdotvii

Michigan VII Update is produced by the University of Michigan Transportation Research Institute.

UMTRI

For permission to reprint text or graphics, or if you have suggestions or comments, contact Monica Milla, UMTRI editor, at 734-936-1052.

For all other matters, the UMTRI point of contact is Todd Anuskiewicz, 734-763-4668, toddan@umich.edu.